IN THE CLAIMS:

Claims 1-5, 7, 8, 10, 19, and 20 have been amended herein. Claim 6 has been cancelled. Please note that all claims currently pending and under consideration in the referenced application are shown below, in clean form, for clarity. Please enter these claims as amended. Also attached is a version with markings to show changes made to the claims.

1. (Amended) A method for forming a semiconductor device structure comprising: providing a semiconductor substrate assembly having a surface; and depositing $RuSi_xO_y$ by chemical vapor deposition to form a diffusion barrier layer over at least a portion of the surface.

2. (Twice amended) The method of claim 1, wherein depositing $RuSi_xO_y$ by chemical vapor deposition comprises depositing the layer of $RuSi_xO_y$ where x is in a range of about 0.01 to about 10.

3. (Twice amended) The method of claim 2, wherein depositing $RuSi_xO_y$ by chemical vapor deposition comprises depositing the layer of $RuSi_xO_y$ where x is about 0.4.

4. (Twice amended) The method of claim 1, wherein depositing $RuSi_xO_y$ by chemical vapor deposition comprises depositing the layer of $RuSi_xO_y$ where y is in a range of about 0.01 to about 10.

5. (Twice amended) The method of claim 4, wherein forming the diffusion barrier layer over at least a portion of the surface comprises forming the layer of $RuSi_xO_y$ where y is about 0.05.

7. (Twice amended) The method of claim 1, wherein depositing the $RuSi_xO_y$ comprises depositing $RuSi_xO_y$ by atomic layer deposition.

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8. (Twice amended) The method of claim 7, wherein depositing the $RuSi_xO_y$ comprises depositing three to five monolayers of $RuSi_xO_y$.

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10. (Amended) A method for forming a semiconductor device structure comprising:
providing a semiconductor substrate assembly having a surface;
forming a layer of ruthenium relative to a silicon-containing region; and
performing an anneal in an oxidizing atmosphere to form $RuSi_xO_y$ from the layer of ruthenium and the silicon-containing region.

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11. The method of claim 10, wherein forming the layer of ruthenium includes depositing the layer of ruthenium by chemical vapor deposition.

12. The method of claim 10, wherein forming the layer of ruthenium includes depositing the layer of ruthenium by atomic layer deposition.

13. The method of claim 12, wherein forming the layer of ruthenium includes depositing three to five monolayers of $RuSi_xO_y$.

14. (Previously amended) The method of claim 10, wherein performing the anneal in an oxidizing atmosphere includes performing an anneal in an atmosphere including an oxidizing gas.

15. (Previously amended) The method of claim 1, further including forming at least one additional conductive material over the diffusion barrier layer and selecting the at least one additional conductive material from a group of a metal and a conductive metal oxide.

16. (Previously amended) The method of claim 10, wherein performing the anneal in an oxidizing atmosphere to form the $RuSi_xO_y$ includes performing an anneal at a temperature in a range of about 400° C to about 1000° C.

17. (Previously amended) The method of claim 10, wherein performing the anneal in an oxidizing atmosphere to form $RuSi_xO_y$ from the layer of ruthenium and the silicon-containing region comprises performing said anneal in an atmosphere comprising air, oxygen, and oxygen-containing compounds.

18. (Previously amended) The method of claim 10, wherein said silicon-containing region includes at least a portion of said semiconductor substrate assembly.

19. (Amended) The method of claim 1, wherein said $RuSi_xO_y$ is deposited in an oxidizing atmosphere.

20. (Twice amended) The method of claim 19, wherein said $RuSi_xO_y$ is deposited in an atmosphere including an oxidizing gas.

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59. (Previously amended) A method for forming a semiconductor device structure having a $RuSi_xO_y$ barrier layer, the method comprising:

(a) placing a semiconductor substrate assembly in a reaction chamber, said semiconductor substrate assembly having a surface;

(b) introducing a ruthenium precursor into said reaction chamber to form a single layer of ruthenium on at least a portion of said semiconductor substrate assembly surface;

(c) introducing a nonreactive gas into said reaction chamber to substantially cover said single layer of ruthenium and purge said ruthenium precursor from said reaction chamber;

(d) introducing a silicon precursor into said reaction chamber to form a single layer of $RuSi_xO_y$ on at least a portion of said semiconductor substrate assembly surface; and

(e) introducing a nonreactive gas into said reaction chamber to substantially cover said single layer of $RuSi_xO_y$ and purge said silicon precursor from said reaction chamber.

60. (Previously amended) The method of claim 59, further comprising introducing an oxygen-containing substance into said reaction chamber to form a single barrier layer of $RuSi_xO_y$ on the at least a portion of said semiconductor substrate assembly surface.

61. (Previously amended) The method of claim 59, wherein said introducing said silicon precursor into said reaction chamber comprises introducing said silicon precursor in an oxidizing atmosphere within said reaction chamber.

62. (Previously amended) The method of claim 61, wherein said introducing said silicon precursor in an oxidizing atmosphere comprises introducing said silicon precursor in an atmosphere comprising air, oxygen, or an oxygen-containing compound.

63. The method of claim 59, wherein said ruthenium precursor comprises $C_6H_8Ru(CO)_3$.

64. (Previously amended) The method of claim 59, wherein said introducing said nonreactive gas comprises introducing a nonreactive gas selected from a group consisting of nitrogen, argon, neon, and xenon.

65. (Previously amended) The method of claim 59, wherein said introducing said silicon precursor comprises introducing silane or disilane into said reaction chamber.

66. The method of claim 59, wherein steps (a) through (e) are repeated to form 3 to 5 $RuSi_xO_y$ barrier monolayers.